Statement of Basis

Title V Air Quality Permit Modification

Ellsworth Air Force Base – South Dakota

South Dakota Department of Environment and Natural Resources

TABLE OF CONTENTS

Page

1.0 Operational Description 1
1.1 Existing Equipment 1
1.2 Proposed Equipment 4
1.3 Abandoned/Removed Equipment 4
1.3 Administrative Correction 4

2.0 Potential Emissions 5
2.1 Internal Combustion Engines 5
2.2 Permitted Facility Emissions Summary 8

3.0 New Source Review 9

4.0 Prevention of Significant Deterioration 9

5.0 New Source Performance Standards 9

6.0 National Emission Standards for Hazardous Air Pollutants 10
6.1 National Emissions Standards for Hazardous Air Pollutants 10

7.0 Maximum Achievable Control Technology Standards 11

8.0 Permit Requirements 11
8.1 Emission Limits 11
8.2 State Emission Limits 11
8.3 State Restrictions on Visible Emissions 11
9.0 Performance Tests 11
10.0 Summary of Applicable Requirements 12

11.0 Recommendation 12

Appendix A - Draft Permit Modification 1

1.0 STANDARD CONDITIONS 1
1.1 Operation of source 1

9.0 NEW SOURCE PERFORMANCE STANDARD SUBPART IIII 4
9.1 Emission standards for applicable generators 4

1.0 Operational Description

Ellsworth Air Force Base, hereinafter Ellsworth, operates a federal airfield and support facility in Ellsworth, South Dakota. Title V air quality permit #28.2201-02 was issued to Ellsworth on December 18, 1998. During the permit renewal process the permit number was changed to #28.9904-02 to meet the Department of Environment and Natural Resources (DENR) permit numbering system and operating limits placed in the permit that allow Ellsworth to operate under a minor air quality operating permit. The renewal permit was issued May 2, 2007.

On September 17, 2007, Ellsworth's permit was modified to allow construction and operation of an emergency generator. On January 20, 2009 Ellsworth requested a modification to: replace a 1987 350 kilowatt generator with a 175 kilowatt generator, allow the construction and operation of a 2007 350 kilowatt emergency generator and to remove three abandoned generators from its permit. DENR requested additional information to consider the application to be complete. DENR received the additional forms on March _ 2009, and considered the application complete.

1.1 Existing Equipment

Table 1-1 provides a description of the permitted units, which was derived from the existing operating permit.

Table 1-1 – Description of Permitted Units, Operations, and Processes

Table #1
Description of Permitted Units, Operations, and Processes

Description	Maximum Operating Rate / Capacity	Control Device
FUEL STORAGE TANKS		
Ast-501 – 1996 Brown Minneapolis aboveground storage tank for gasoline at Base Service Station	12,000 gallons	Not applicable
Ast-503 – Tank 17 at Area D, 1997 Brown Minneapolis aboveground storage tank for gasoline	10,000 gallons	Not applicable
Int Tank-002 – Tank16 at Area D, 1985 Salt Creek Welding aboveground storage tank with internal floating roof for JP8	2.31 million gallons	Not applicable
EXTERNAL COMBUSTION SOURCES		
Extcomb-101-1, Burnham Corporation natural gas and propane fired boiler in Building 102	5.23 million Btus per hour heat input	Not applicable
Extcomb-101-2, Burnham Corporation natural gas and propane/air mixture fired boiler in Building 102	5.23 million Btus per hour heat input	Not applicable
Extcomb-102-1, HB Smith natural gas and propane fired boiler in Building 410	9.80 million Btus per hour heat input	Not applicable
Extcomb-102-2, HB Smith natural gas and propane fired boiler in Building 410	9.80 million Btus per hour heat input	Not applicable
Extcomb-109, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7229	7.60 million Btus per hour heat input	Not applicable
Extcomb-113, Well-McCain natural gas and propane fired boiler in Building 7239	4.76 million Btus per hour heat input	Not applicable
Extcomb-119-1, Rite Engineering & Manufacturing Corporation	3.62 million Btus	Not

Description	Maximum Operating Rate / Capacity	Control Device
natural gas and propane/air mixture fired boiler in Building 7250	per hour heat input	applicable
Extcomb-119-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7250	3.62 million Btus per hour heat input	Not applicable
Extcomb-126, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7268	8.00 million Btus per hour heat input	Not applicable
Extcomb-127, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7269	7.60 million Btus per hour heat input	Not applicable
Extcomb-130-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7506	5.23 million Btus per hour heat input	Not applicable
Extcomb-130-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7506	5.23 million Btus per hour heat input	Not applicable
Extcomb-132-1, AJAX natural gas and propane fired boiler in Building 7520	7.00 million Btus per hour heat input	Not applicable
Extcomb-132-2, AJAX natural gas and propane fired boiler in Building 7520	7.00 million Btus per hour heat input	Not applicable
Extcomb-133, Burnham Corporation natural gas and propane fired boiler in Building 7616	3.60 million Btus per hour heat input	Not applicable
Extcomb-136, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7622	5.31 million Btus per hour heat input	Not applicable
Extcomb-138-1, Farrar & Trefts natural gas and propane fired boiler in Building 8201	4.05 million Btus per hour heat input	Not applicable
Extcomb-138-2, Farrar & Trefts natural gas and propane fired boiler in Building 8201	4.05 million Btus per hour heat input	Not applicable
Extcomb-139-1, 1984 Federal Boiler Company natural gas and propane fired boiler in Building 88031	6.30 million Btus per hour heat input	Not applicable
Extcomb-139-2, 1984 Federal Boiler Company natural gas and propane fired boiler in Building 88031	6.30 million Btus per hour heat input	Not applicable
Extcomb-141, 1984 Federal Boiler Company natural gas and propane/air mixture fired boiler in Building 88240	6.30 million Btus per hour heat input	Not applicable
Extcomb-142-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-3, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-4, natural gas and propane fired boiler in Hospital	6.40 million Btus per hour heat input	Not applicable
Extcomb-324, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7624	5.31 million Btus per hour heat input	Not applicable
Extcomb-325, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7621	5.55 million Btus per hour heat input	Not applicable
Extcomb-346-1, L.E.S. natural gas and propane fired boiler in Building 7709	4.43 million Btus per hour heat input	Not applicable
Extcomb-346-2, Weil-McLain natural gas and propane fired	5.95 million Btus	Not

Description	Maximum Operating Rate / Capacity	Control Device
boiler in Building 7709	per hour heat input	applicable
Extcomb-477-1, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7234	6.50 million Btus per hour heat input	Not applicable
Extcomb-477-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7234	6.50 million Btus per hour heat input	Not applicable
Extcomb-478-1, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7236	4.25 million Btus per hour heat input	Not applicable
Extcomb-478-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7236	4.25 million Btus per hour heat input	Not applicable
Extcomb-563-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-563-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-564, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-566-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7502	5.31 million Btus per hour heat input	Not applicable
Extcomb-574-1, 2002 Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 8210	3.75 million Btus per hour heat input	Not applicable
Extcomb-574-2, 2002 Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 8210	3.75 million Btus per hour heat input	Not applicable
INTERNAL COMBUSTION ENGINE SOURCES		
Intcomb-149, 1981 Caterpillar diesel fired generator in Building 6000	600 kilowatts heat output	Not applicable
Intcomb-131, 1987 Cummins diesel fired generator in Building 7255	400 kilowatts heat output	Not applicable
Intcomb-104, 1988 Onan diesel fired generator in Building 7438A	500 kilowatts heat output	Not applicable
Intcomb-130, 1987 Cummins, diesel fired generator in Building 7273	350 kilowatts heat output	Not applicable
Intcomb-107, 1980 Detroit, diesel fired boiler in Building 88113	540 kilowatts heat output	Not applicable
Intcomb-106, 1980 Detroit, diesel fired boiler in Building 88138	540 kilowatts heat output	Not applicable
Intcomb-203, 2005Cummins diesel fired generator in Building 7918	400 kilowatts heat output	Not applicable
Intcomb-7502, 2000 Cummins diesel fired generator in Building 7502	400 kilowatts heat output	Not applicable
Intcomb-7501, 2006 Caterpillar diesel fired generator in RAPCON – Building 7501	600 kilowatts heat output	Not applicable
Intcomb-920 – 2007 Cummins, DFEG-5789270, diesel fired generator in Pumphouse – Building 920	350 kilowatts electrical output	Not applicable
Intcomb-88490 – 2007 Katolight, D550FRV4, diesel fired generator for firepump in Building 88490	550 kilowatts electrical output	Not applicable
Intcomb-7263 – 2007 Katolight, D500FRV4, diesel fired	500 kilowatts	Not

Description	Maximum Operating Rate / Capacity	Control Device
generator for firepump in Building 7263	electrical output	applicable
Intcomb-4040 – 2007 Cummins, DQFAC, diesel fired generator in Financial Services – Building 4040	900 kilowatts electrical output	Not applicable
SURFACE COATING		
Paint Bth-001 – 1987, Binks air atomization HVLP paint booth in Building 102, Transportation	Not applicable	Exhaust filters
Paint Bth-004 – 1999, Binks air atomization HVLP paint booth for aerospace ground equipment and corrosion control in Building 7234	Not applicable	Exhaust filters

1.2 Proposed Equipment

Table 1-2 provides a description of the proposed equipment to be included in the operating permit.

Table 1-2 –Proposed Equipment

Description	Maximum Operating Rate / Capacity	Control Device
INTERNAL COMBUSTION ENGINE SOURCE		
Intcomb-130 – 2006 Onan diesel fired generator in Building 7273, ECP Lights	175 kilowatts output	Not applicable

1.3 Abandoned/Removed Equipment

Table 1-3 provides a description of the proposed equipment to be deleted from the operating permit.

Table 1-3 – Abandoned/Removed Equipment

Description	Maximum Operating Rate / Capacity	Control Device
INTERNAL COMBUSTION ENGINE SOURCE		
Intcomb-104, 1988 Onan diesel fired generator in Building 7438A	500 kilowatts heat output	Not applicable
Intcomb-106, 1980 Detroit, diesel fired boiler in Building 88138	540 kilowatts heat output	Not applicable
Intcomb-107, 1980 Detroit, diesel fired boiler in Building 88113	540 kilowatts heat output	Not applicable
Intcomb-130, 1987 Cummins, diesel fired generator in Building 7273	350 kilowatts heat output	Not applicable

1.3 Administrative Correction

Ellsworth requested that the current permit be corrected to reflect that INTCOMB-920 is located in Building 923, not 920 as listed in the permit. Ellsworth also stated that INTCOMB -106 and INTCOMB -107 are generators, not boilers as listed on the permit. To determine the reduction in emissions from the removal of this equipment, the review will consider the two sources as boilers, and calculate emissions accordingly.

2.0 Potential Emissions

DENR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DENR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

Potential emissions for each unit assume the unit operates every hour of every day of the year at maximum designed operating capacity, while using the fuel that will result in the greatest emissions. Physical or operational limits on the operating capacity or emissions rate of a unit, including pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, are included in the potential emission calculations if the limitation is enforceable.

Ellsworth's current permit includes a federally enforceable limit on their internal combustion units in order to limit nitrogen oxide emissions. The limit is 200 operating hours per engine per 12-month rolling period for each internal combustion units. The proposed unit will be required to operate under the same limit and potential emissions will be based on 200 hours of operation per year.

2.1 Internal Combustion Engines

Table 2-1 shows the specific pollutant emission factors associated with each engine classification while burning diesel fuel. The applicant submitted manufacturer emissions data for carbon monoxide, nitrogen oxide, volatile organic compounds, carbon dioxide, and particulate matter from performance tests on this model of generator. AP-42 lists emission factors for generators based on the manufacturer's output rating. Units larger than 600 horsepower are classified as large. The emission factors for sulfur and hazardous air pollutants are derived from AP-42 – Fifth Edition, Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4, October 1996.

Table 2-1 Emission Factors - Generators

Emission Factors	**pounds per million Btu (lb/MMBtu)**							
Classification	**TSP**	**PM10**	**SO_2**	**No_x**	**CO**	**CO_2**	**VOC[b]**	**HAPs[c]**
Industrial (<600 HP)	0.31	0.31	0.29	4.41	0.95	164	0.3185	0.0064
Large (>600HP)	0.697	0.0573	0.051[a]	3.2	0.85	165	0.082	0.0015

[a] _For Large (>600 Hp) generators. Assumes that all sulfur in the fuel is converted to SO_2. S1 is % sulfur in fuel. Assume max Sulfur content of 0.5%. S=1.101 x 0.5%=0.051

[b] – Based on manufacturer data for total hydrocarbons (0.02 lbs/hr) and the methane content (equal to 9%) of total hydrocarbon per Table 3.4-1.

[c]– Based on VOC emission factor multiplied by HAP/VOC ratio in Table 3.4-1 and 3.4-4 (0.0819/0.0015)

Equation 2-1 calculates the generator's potential emissions of each pollutant based on the heat input capacities, the emission factors listed in Table 2-1, and number of hours the generator operates per year. The emission calculations were performed using two scenarios. The first scenario is based on the generator operating without

any operational limitations (8,760 hours per year). The second scenario takes into account the permit's current enforceable operational restriction of 200 hours per 12-month rolling period for the existing generators.

Equation 2-1 – Generator Potential Emissions

$$Potential\left[\frac{tons}{year}\right] = emission\ factor\left[\frac{lbs}{hour}\right] \times \left[\frac{hours}{year}\right] \div 2{,}000\left[\frac{lbs}{ton}\right]$$

The resulting potential emissions are shown in the Table 2-2.

Table 2-2 –Potential Emissions from proposed generators (tons per year)

	TSP	PM10	SO_2	No_x	CO	VOC	HAPs
175 KW Onan Generator – 8,760 hrs per year	2.3	2.3	2.2	33.0	7.1	2.4	0.05
175 KW Onan Generator – 200 hours per year	0.01	0.01	0.01	0.17	0.04	0.01	0.0

Ellsworth's current permit includes a federally enforceable limit on their internal combustion units in order to limit nitrogen oxide emissions. The limit is 200 operating hours per engine per 12-month rolling period for each internal combustion units. Potential emissions based upon 200 hours per year are shown in Table 2-?

Equipment Removed/Abandoned

The applicant stated that units 104, 106, 107 & 130 have been abandoned/removed from service and should not be included in the permit.

Previous SOB's calculated the potential emissions for Units 104 and 130, based on 8,760 hours per year and 200 hours per year as shown in Table 2-

Table 2-3 –Potential Emissions from Units 104 and 130(tons per year)

	TSP	PM10	SO2	Nox	CO	VOC	HAPs
INT-104 1988 Generator-500 Kw	14.9	1.2	1.1	68.3	18.2	1.8	0.0
INT-130 1987 Generator-350 Kw	4.6	4.6	4.3	65.9	14.2	4.8	0.1
Total – 8,760 hours	19.5	5.8	5.4	134.2	32.4	6.6	0.1
INT-104 1988 Generator-500 Kw	0.34	0.03	0.02	1.56	0.41	0.04	0.0
INT-130 1987 Generator-350 Kw	0.11	0.11	0.1	1.51	0.32	0.11	0.0
Total – 200 hours	1.45	0.14	0.12	3.07	0.73	0.15	0.0

Table 1-1 lists INT's 106 and 107 as boilers. However, the 2009 application states that they are both generators. Previous SOBs had calculated the emissions from these sources based upon emission factors for external combustion sources (boilers). For this review, the two sources will be considered boilers and their emissions subtracted from the facility's total. As requested by the applicant, these sources will be removed and not included in the modified permit.

The application lists the external combustion units (boilers) as being fired with natural gas and propane. In EPA's *AP-42 Air Pollutant Emission Factors*, combustion emission factors are determined by the designed gross heat input rate. Natural gas boilers with gross heat input ratings less than 100 million Btus per hour are considered small boilers. All permitted boilers have gross heat input ratings of less than 100 million Btus per hour and are considered small boilers. The emission factors for firing these units with natural gas are derived from *AP-42 Air Pollutant Emission Factors* (Tables 1.4-1 and 1.4-2, pages 1.2-5 and 1.4-6, 7/98) and are listed below:

Emission Factors – lbs/MMcf							
Small boilers < 100 MM Btu/hr	TSP[a]	PM10[a]	SO_2	NOx	CO	VOC	HAPs
	7.6	7.6	0.6	100	84	5.5	1.889

[a] – All of the particulate emitted by a boiler fueled with natural gas is assumed to be less than 0.1 microns in diameter. Therefore, the emission factor for PM10 is equivalent to TSP.

For propane, a boiler with a gross heat input rating less than 10 million Btus per hour is considered a commercial boiler. All permitted boilers have gross heat input ratings below 10 million Btus per hour and are considered commercial boilers. The following emission factors for firing the boilers with propane are derived from *AP-42 Air Pollutant Emission Factors* (Table 1.5-1, page 1.5-3, 10/96):

Emission Factors – lbs/MMcf							
Small boilers < 100 MM Btu/hr	TSP[a]	PM10[a]	SO_2	NOx	CO	VOC	HAPs
	0.6	0.6	0.02	19	3.2	0.3	0.11

[a] – All of the particulate emitted by a boiler fueled with propane is assumed to be less than 0.1 microns in diameter. Therefore, the emission factor for PM10 is equivalent to TSP.
[b] – The average sulfur content of propane gas is assumed to be similar to the sulfur content of natural gas and butane gas. Natural gas has an average sulfur content of 0.2 grains per 100 cubic feet and butane has an average sulfur content of 0.18 grains per 100 cubic feet. The higher value was used in the determination of the emission factor.
[c] – The ratio of HAPs to VOC was assumed identical to that ratio for natural gas.

In order to compare emission rates for the fuels DENR converted the AP-42 emission factors from units of pounds pollutant per volume of fuel burned to pounds pollutant per million Btu of heat input based on a natural gas heat capacity of 1,050 million Btus per million cubic feet and a propane heat capacity of 91.5 million Btus per thousand gallons. The resulting values are shown in Table 2-4.

Table 2-4 – Emission Factor Comparison (pounds per MMBtu)

Fuel	PM	PM10	SO_2	NOx	CO	VOC	HAPs
Natural Gas	**0.0072**	**0.0072**	**0.0006**	0.095	**0.08**	**0.0052**	**0.0018**
Propane	0.0044	0.0044	0.0002	**0.153**	0.02	0.0051	**0.0018**

The sum of the heat output capacities of the two boilers is 1080 kw, which converts to 3.69 million Btus per hour. Using a heat conversion efficiency of 85%, the combined heat input capacity of the two boilers is 4.34 MM Btus per hour. Based on operating 8,760 hours per year, the annual heat input for all of the permitted boilers is 38,000 million Btus per year. DENR used Equation 2-1 and the emission factors in Table 2-4 to determine the greatest emissions from the external combustion units. The results are displayed in Table 2-5.

Equation 2-1 – Calculating Potential Emissions

$$Potential\left[\frac{tons}{year}\right] = 38{,}000\left[\frac{MMBtus}{year}\right] \times emission\ factor\left[\frac{pounds}{MMBtus}\right] \div 2{,}000\left[\frac{pounds}{ton}\right]$$

Table 2-5 – Potential Emissions – External Combustion Sources (tons per year)

Units 106 and 107	PM	PM10	SO_2	NOx	CO	VOC	HAPs
8,760 hours	32.16	2.64	2.36	147.6	39.2	3.78	0.06
200 hours	0.74	0.06	0.06	3.38	0.9	0.08	0.0

The combined total emissions, based upon 200 hours of operation per year, of the equipment that has been abandoned/removed is shown in Table 2-6

Table 2- 6 - Combined Emissions from Abandoned/Removed Equipment (tons per year)

Source	PM	PM10	SO_2	NOx	CO	VOC	HAPs
Units 104 and 130	1.45	0.14	0.12	3.07	0.73	0.15	0.0
Units 106 and 107	0.74	0.06	0.06	3.38	0.90	0.08	0.0
Total	2.19	0.20	0.18	6.45	1.63	0.23	0.0

2.2 Permitted Facility Emissions Summary

The permitted emissions for Ellsworth are summarized in Table 2-7. The summary takes into account the operational restriction of 200 hours per 12-month rolling period for the proposed generator. If the restriction is not taken into account, Ellsworth would not be able to maintain its minor permit.

Table 2-7 – Permitted Emissions (tons per year)

Source	PM	PM10	SO_2	NOx	CO	VOC	HAPs
Storage Tanks	0.0	0.0	0.0	0.0	0.0	7.6	0.7
Boilers	3.7	3.7	0.3	78.8	41.2	2.7	0.9
Existing Generators	0.2	0.1	0.1	7.3	1.9	0.2	0.0
Paint Booths	0.0	0.0	0.0	0.0	0.0	7.3	3.0
Currently Permitted Total	**3.9**	**3.8**	**0.4**	**86.1**	**43.1**	**17.8**	**4.6**
Proposed Generator	0.01	0.01	0.01	0.17	0.04	0.01	0.0
Removed/Abandoned Equipment	(2.19)	(0.20)	(0.18)	(6.45)	(3.38)	(0.90)	0.0
Proposed Total	**1.72**	**3.61**	**0.23**	**79.8**	**39.8**	**16.9**	**4.6**

3.0 New Source Review

ARSD 74:36:10:01 notes that new source review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. This facility is located in Pennington and Meade Counties, which are in attainment for all the pollutants regulated under the Clean Air Act. Therefore, this facility is not subject to new source review.

4.0 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated pollutant.

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated pollutant. The major source threshold for all other sources is 250 tons per year of any regulated pollutant. Ellsworth is not considered one of the 28 categories; therefore, Ellsworth would be a major source under the PSD program if its potential to emit is greater than 250 ton per year.

Ellsworth's current operating permit includes conditions to maintain its actual emissions below the major source threshold under the Title V air quality permit program (100 tons per year of any regulated pollutant). The enforceable permit conditions will ensure that nitrogen oxide and carbon monoxide emissions will not exceed the PSD major source threshold. Therefore, Ellsworth is considered a minor source under the PSD program.

5.0 New Source Performance Standards

DENR reviewed the new source performance standards (NSPS) listed in the Code of Federal Regulation to determine applicability to this modification. The following may be applicable:

5.1 40 CFR Part 60 Subpart IIII

The Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is applicable to owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) that are manufactured after April 1, 2006 and are not fire pump engines, or manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

Based on the application the 175 kw Onan generator , was manufactured in 2006 and has a displacement of 8.9 liters (approximately 1.5 liters/cylinder).

Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in table 1 to this subpart.

Table 5-1 – Subpart IIII Emission Standards

Maximum engine power	Emission standards for stationary pre-2007 model year engines with a displacement of <10 liters per cylinder and 2007–2010 model year engines >2,237 KW (3,000 HP) and with a displacement of <10 liters per cylinder in g/KW-hr (g/HP-hr)				
	NMHC + NO_X	**HC**	**NO_X**	**CO**	**PM**
130≤KW<225		1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40

Table 5-2 Manufacturer Emission – grams-HP/hr

	NOx + HC	**NO_X**	**CO**	**PM**
175 kw generator	**3.0**		2.6	0.15

The manufacturer data states the generator will meet the EPA Tier 3 Equivalent Emission limits (grams per kilowatt-hour).

The owner or operator of an emergency stationary CI internal combustion engine must install a non-resettable hour meter prior to startup of the engine.

6.0 National Emission Standards for Hazardous Air Pollutants

6.1 National Emissions Standards for Hazardous Air Pollutants

The department reviewed the Maximum Achievable Control Technology (MACT) standards and determined that one MACT standard needs to be reviewed further to determine if it is applicable.

40 CFR Part 63, Subpart ZZZZ is subject to owners or operators of a stationary Reciprocating Combustion Engine (RICE) at a major and area source of HAP emissions. Stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. Ellsworth is not a major source of HAP; however it is an area source of HAP. As noted in 40 CFR §63.6590(a)(2)(iii) a new stationary RICE is a stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

The proposed generator was installed in 2009; therefore Ellsworth is applicable to this subpart. 40 CFR §63.6590(c) states an affected source that is a new stationary reciprocating internal combustion engine located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR Part 60 Subpart IIII for compression ignition engines. No further requirements apply for such engines under this subpart.

As stated above, Ellsworth is applicable to 40 CFR Part 60 Subpart IIII.

7.0 Maximum Achievable Control Technology Standards

Ellsworth's potential HAP emissions are less than the major source threshold under the Title V air quality permit program and there are no Maximum Achievable Control Technology Standards for area sources that are applicable to Ellsworth's operations. Therefore, this change at the facility is not subject to Maximum Achievable Control Technology requirements.

8.0 Permit Requirements

Revisions to air quality operating permits that meet the requirements of the ARSD 74:36:01:10 are required to follow the procedural requirements for permit modification. The proposed revision requires a case-by-case determination of the limits in the applicable New Source Performance Standard and therefore meets the definition of a permit modification.

Typically sources applicable to a federal New Source Performance Standard are required to obtain a Title V permit; however, DENR has not required a source to obtain a Title V permit in cases where the New Source Performance Standard just requires the source to maintain records or reports. The Generator's New Source Performance Standard is just requiring the Ellsworth to maintain records. Therefore, DENR will not require Ellsworth to obtain a Title V permit. In addition, the New Source Performance Standard exempts sources subject to the Generator's New Source Performance Standard from obtaining a Title V permit based solely on their applicability to the subpart.

8.1 Emission Limits

ARSD 74:36 sets forth the state limits on particulate, sulfur dioxide, and opacity limits. Particulate and sulfur dioxide limits are discussed below. In accordance with 74:36:12, permitted units are subject to a visible emission limit of 20 percent opacity.

8.2 State Emission Limits

Total suspended particulate and sulfur dioxide emission limits are applicable to fuel burning units. Ellsworth's generators are considered fuel burning units. The total suspended particulate and sulfur dioxide emission limits for fuel burning units are derived from ARSD 74:36:06:02. In accordance with ARSD 74:36:06:01, a unit that is subject to a NSPS that contains limits on particulate matter and/or sulfur dioxide is not applicable to the state's particulate matter and/or sulfur dioxide emission limits. The NSPS that Ellsworth is subject to contains particulate matter and sulfur dioxide emission limits; therefore the state's particulate matter and sulfur dioxide emission limits are not applicable.

8.3 State Restrictions on Visible Emissions

Visible emissions are applicable to any unit that discharges to the ambient air. In accordance with ARSD 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units. Ellsworth must control the opacity at less than 20 percent for the generator.

9.0 Performance Tests

DENR will not require any performance test to demonstrate compliance with state emission limits and the applicable NSPS does not require performance testing for certified units of this size. The permit contains language that allows DENR to require a performance test or fuel analysis during the term of the permit if an investigation of the facility warrants it.

10.0 Summary of Applicable Requirements

The following regulations are applicable to the proposed modification:

- ARSD 74:36:04 – Operating Permits for Minor Sources;
- ARSD 74:36:07 – New Source Performance Standards;
- ARSD 74:36:06 – Regulated Air Pollutant Emissions;
- ARSD 74:36:11 – Stack Performance Testing; and
- ARSD 74:36:12 – Control of Visible Emissions.

11.0 Recommendation

DENR recommends conditional approval for Ellsworth Air Force Base to modify it existing air quality permit by constructing and operating the proposed emergency generator. Questions regarding this review and the draft permit should be directed to Keith Gestring, Natural Resources Project Engineer, Air Quality Program at (605) 677-6165.

Appendix A - Draft Permit Modification

DRAFT PERMIT MODIFICATION

The following changes to the existing permit represent changes that meet the definition of a permit amendment. Additions to the existing permit are represented in blue, bold, and underlined and deletions are represented in red with overstrikes. In the case where permit conditions are deleted or added between permit conditions, the permit conditions will be renumbered appropriately when the permit is issued.

1.0 STANDARD CONDITIONS

1.1 Operation of source. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:04:15(9), the owner or operator shall operate the units, controls, and processes as described in Table #1 and in accordance with the statements, representations, and supporting data contained in the complete permit application submitted and dated April 02, 2003, July 18, 2004, **August 10, 2007**, and **April _ 2009**, unless modified by the conditions of this permit. The application consists of the application forms, supporting data, and supplementary correspondence. If the owner or operator becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted.

Table #1
Description of Permitted Units, Operations, and Processes

Description	Maximum Operating Rate / Capacity	Control Device
FUEL STORAGE TANKS		
Ast-501 – 1996 Brown Minneapolis aboveground storage tank for gasoline at Base Service Station	12,000 gallons	Not applicable
Ast-503 – Tank 17 at Area D, 1997 Brown Minneapolis aboveground storage tank for gasoline	10,000 gallons	Not applicable
Int Tank-002 – Tank16 at Area D, 1985 Salt Creek Welding aboveground storage tank with internal floating roof for JP8	2.31 million gallons	Not applicable
EXTERNAL COMBUSTION SOURCES		
Extcomb-101-1, Burnham Corporation natural gas and propane fired boiler in Building 102	5.23 million Btus per hour heat input	Not applicable
Extcomb-101-2, Burnham Corporation natural gas and propane/air mixture fired boiler in Building 102	5.23 million Btus per hour heat input	Not applicable
Extcomb-102-1, HB Smith natural gas and propane fired boiler in Building 410	9.80 million Btus per hour heat input	Not applicable
Extcomb-102-2, HB Smith natural gas and propane fired boiler in Building 410	9.80 million Btus per hour heat input	Not applicable
Extcomb-109, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7229	7.60 million Btus per hour heat input	Not applicable

Description	Maximum Operating Rate / Capacity	Control Device
Extcomb-113, Well-McCain natural gas and propane fired boiler in Building 7239	4.76 million Btus per hour heat input	Not applicable
Extcomb-119-1, Rite Engineering & Manufacturing Corporation natural gas and propane/air mixture fired boiler in Building 7250	3.62 million Btus per hour heat input	Not applicable
Extcomb-119-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7250	3.62 million Btus per hour heat input	Not applicable
Extcomb-126, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7268	8.00 million Btus per hour heat input	Not applicable
Extcomb-127, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7269	7.60 million Btus per hour heat input	Not applicable
Extcomb-130-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7506	5.23 million Btus per hour heat input	Not applicable
Extcomb-130-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7506	5.23 million Btus per hour heat input	Not applicable
Extcomb-132-1, AJAX natural gas and propane fired boiler in Building 7520	7.00 million Btus per hour heat input	Not applicable
Extcomb-132-2, AJAX natural gas and propane fired boiler in Building 7520	7.00 million Btus per hour heat input	Not applicable
Extcomb-133, Burnham Corporation natural gas and propane fired boiler in Building 7616	3.60 million Btus per hour heat input	Not applicable
Extcomb-136, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7622	5.31 million Btus per hour heat input	Not applicable
Extcomb-138-1, Farrar & Trefts natural gas and propane fired boiler in Building 8201	4.05 million Btus per hour heat input	Not applicable
Extcomb-138-2, Farrar & Trefts natural gas and propane fired boiler in Building 8201	4.05 million Btus per hour heat input	Not applicable
Extcomb-139-1, 1984 Federal Boiler Company natural gas and propane fired boiler in Building 88031	6.30 million Btus per hour heat input	Not applicable
Extcomb-139-2, 1984 Federal Boiler Company natural gas and propane fired boiler in Building 88031	6.30 million Btus per hour heat input	Not applicable
Extcomb-141, 1984 Federal Boiler Company natural gas and propane/air mixture fired boiler in Building 88240	6.30 million Btus per hour heat input	Not applicable
Extcomb-142-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-3, Kewanee Boiler Corporation natural gas and propane fired boiler in Hospital, Building 5902	6.28 million Btus per hour heat input	Not applicable
Extcomb-142-4, natural gas and propane fired boiler in Hospital	6.40 million Btus per hour heat input	Not applicable
Extcomb-324, Kewanee Boiler Corporation natural gas and	5.31 million Btus	Not

Description	Maximum Operating Rate / Capacity	Control Device
propane fired boiler in Building 7624	per hour heat input	applicable
Extcomb-325, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7621	5.55 million Btus per hour heat input	Not applicable
Extcomb-346-1, L.E.S. natural gas and propane fired boiler in Building 7709	4.43 million Btus per hour heat input	Not applicable
Extcomb-346-2, Weil-McLain natural gas and propane fired boiler in Building 7709	5.95 million Btus per hour heat input	Not applicable
Extcomb-477-1, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7234	6.50 million Btus per hour heat input	Not applicable
Extcomb-477-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7234	6.50 million Btus per hour heat input	Not applicable
Extcomb-478-1, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7236	4.25 million Btus per hour heat input	Not applicable
Extcomb-478-2, Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 7236	4.25 million Btus per hour heat input	Not applicable
Extcomb-563-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-563-2, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-564, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7510	4.71 million Btus per hour heat input	Not applicable
Extcomb-566-1, Kewanee Boiler Corporation natural gas and propane fired boiler in Building 7502	5.31 million Btus per hour heat input	Not applicable
Extcomb-574-1, 2002 Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 8210	3.75 million Btus per hour heat input	Not applicable
Extcomb-574-2, 2002 Rite Engineering & Manufacturing Corporation natural gas and propane fired boiler in Building 8210	3.75 million Btus per hour heat input	Not applicable
INTERNAL COMBUSTION ENGINE SOURCES		
Intcomb-149, 1981 Caterpillar diesel fired generator in Building 6000	600 kilowatts heat output	Not applicable
Intcomb-131, 1987 Cummins diesel fired generator in Building 7255	400 kilowatts heat output	Not applicable
~~Intcomb-104, 1988 Onan diesel fired generator in Building 7438A~~	~~500 kilowatts heat output~~	~~Not applicable~~
~~Intcomb-130, 1987 Cummins, diesel fired generator in Building 7273~~	~~350 kilowatts heat output~~	~~Not applicable~~
~~Intcomb-107, 1980 Detroit, diesel fired boiler in Building 88113~~	~~540 kilowatts heat output~~	~~Not applicable~~
~~Intcomb-106, 1980 Detroit, diesel fired boiler in Building 88138~~	~~540 kilowatts heat output~~	~~Not applicable~~
Intcomb-203, 1988 Caterpillar diesel fired generator in Building 7918	1,000 kilowatts heat output	Not applicable

Description	Maximum Operating Rate / Capacity	Control Device
Intcomb-7502, 2000 Cummins diesel fired generator in Building 7502	400 kilowatts heat output	Not applicable
Intcomb-7501, 2006 Caterpillar diesel fired generator in RAPCON – Building 7501	600 kilowatts heat output	Not applicable
Intcomb-920 – 2007 Cummins, DFEG-5789270, diesel fired generator in Pumphouse – Building ~~920~~ **923**	350 kilowatts electrical output	Not applicable
Intcomb – 7237, 2006 Onan diesel fired generator in Building 7273	**175 kilowatt heat output**	**Not applicable**
SURFACE COATING		
Paint Bth-001 – 1987, Binks air atomization HVLP paint booth in Building 102, Transportation	Not applicable	Exhaust filters
Paint Bth-004 – 1999, Binks air atomization HVLP paint booth for aerospace ground equipment and corrosion control in Building 7234	Not applicable	Exhaust filters

9.0 NEW SOURCE PERFORMANCE STANDARD SUBPART IIII

9.1 Emission standards for applicable generators. In accordance with ARSD 74:36:07:88, as referenced to 40 CFR § 60.4205, the owner or operator shall not allow the emissions in excess of the emission limits listed in Table 9-1 for the appropriate stationary compression ignition engine.

Table 9-1 – NSPS Emission Limits [1]

Unit	PM [2]	THC [3]	NOx [4]	CO [5]	NMHC and NOx [6]	Opacity
Intcomb-7501	0.54	1.3	9.2	11.4	-	-
Intcomb-920	0.20	-	-	3.5	6.4	20% during acceleration; 15% during lugging mode; and 50% during the peaks in either acceleration or lugging mode
Intcomb-7263	0.54	-	-	3.5	10.5	-
Intcomb-88490	0.54	-	-	3.5	10.5	-
Intcomb-4040	0.20	-	-	3.5	6.4	20% during acceleration; 15% during lugging mode; and 50% during the peaks in

						either acceleration or lugging mode
Intcomb -7273	**0.54**	**1.3**	**9.2**	**11.4**	**-**	

[1] **The emission limits are in grams per kilowatt hour**
[2] **PM = Particulate Matter**
[3] **THC = Total Hydrocarbons**
[4] **NOx = Nitrogen Oxides**
[5] **CO = Carbon Monoxide**
[6] **NMHC and NOx = Nonmethane Hydrocarbons and Nitrogen Oxides**